Appl. No. 10/774128

In the Claims:

Listing of all claims:

1-24. (Cancelled.)

25. (Previously presented) A welding, cutting or heating system capable of receiving a range of input voltages spanning at least two input utility voltages, comprising:

an input circuit configured to receive any input voltage within the range of input voltages, and configured to provide a first dc signal;

a converter configured to receive the first dc signal and to provide a converter output, and configured to receive at least one control input;

an output circuit configured to receive the converter output and to provide a welding, heating or cutting signal; and

a controller, including a power factor correction circuit, configured to provide at least one control signal to the converter.

26. (Previously presented) The system of claim 25, further comprising an auxiliary power source configured to receive the any input voltage within the range of input voltages and configured to provide a control power signal to the controller.

27. (Previously presented) The system of claim 26, wherein the auxiliary power source is capable of providing the control power signal at a preselected control signal voltage, regardless of the magnitude of the any input voltage.

28. (Previously presented) The system of claim 27, wherein the output circuit further comprises a pulsed transformer.

29. (Previously presented) The system of claim 28, wherein the convertor includes a boost circuit.

30. (Previously presented) The system of claim 29, wherein the output circuit includes a pulse width modulator connected to the transformer.

31. (Cancelled)

32. (Previously presented) A method of providing welding, cutting or heating current from a range of input voltages spanning at least two input utility voltages, comprising:

receiving an input voltage from within the range and converting it to a first dc bus having a voltage magnitude higher than the input voltage;

controlling the converting, including power factor correcting by controlling a switch; and

receiving the dc bus and providing in response thereto an output current having an output magnitude suitable for a welding, heating or cutting.

33. (Previously presented) The method of claim 32, wherein converting includes rectifying.

34. (Currently Amended) The method of claim 32, further comprising deriving auxiliary power <u>from</u> the input voltage within the range of input voltages and providing the derived auxiliary power as a power signal to a controller.

35. (Previously presented) The method of claim 34, wherein providing the derived auxiliary power includes providing the derived auxiliary power at a preselected control signal voltage, regardless of the magnitude of the input voltage.

36. (Previously presented) The method system of claim 34, wherein providing in response thereto includes pulsing a transformer.

37. (Previously presented) The method of claim 36, wherein converting includes boost converting.

38. (Previously presented) The method of claim 37, wherein providing in response thereto further comprises pulse width modulating the transformer.

39. (Cancelled)

40. (Previously presented) The method of claim 38 wherein providing in response thereto further comprises rectifying the output of the transformer.

41. (Previously presented) A welding, cutting or heating system capable of receiving a range of input voltages spanning at least two input utility voltages, comprising:

input means for receiving any input voltage within the range of input voltages, and for providing a first dc signal;

converter means for receiving the first dc signal and providing a converter output in response to at least one control input;

Appl. No. 10/774128

output means for receiving the converter output and providing a welding, heating or cutting signal; and

control means for controlling, including power factor correcting, the converter means, connected to the converter means.

42. (Previously presented) The system of claim 41, further comprising auxiliary power means for providing a control power signal to the control means in response to receiving the any input voltage within the range of input voltages.

43. (Previously presented) The system of claim 42 wherein the auxiliary power means is further for providing the control power signal at a preselected control signal voltage regardless of the magnitude of the any input voltage.

44. (Previously presented) The system of claim 41, wherein the output means further comprises means for pulsing a transformer.

45. (Previously presented) The system of claim 44, wherein the convertor means includes means for boosting a voltage.

46. (Previously presented) The system of claim 44, wherein the output means further includes means for pulse width modulating the transformer.

47. (Cancelled)

48. (Previously presented) A power source for welding, cutting or heating current, comprising:

means for receiving and converting an input voltage from a range of input voltages spanning at least two input utility voltages to a first dc bus having a voltage magnitude higher than the input voltage;

means for controlling the means for receiving and converting, including means for power factor correcting by controlling a switch, connected to the means for receiving and converting; and

means for receiving the dc bus and providing in response thereto an output current having an output magnitude suitable for a welding, heating or cutting.

49. (Previously presented) The power source of claim 48, wherein the means for receiving and converting includes means for rectifying.

50. (Previously presented) The power source of claim 48, further comprising means for deriving auxiliary power from the input voltage and providing the derived power as a power signal to the means for controlling.

51. (Previously presented) The power source of claim 50, wherein the means for deriving auxiliary power includes means for providing the derived auxiliary power at a preselected control signal voltage, regardless of the magnitude of the input voltage.

52. (Previously presented) The power source of claim 51, wherein the means for receiving and converting includes means for boost converting to provide the first dc bus.

53. (Cancelled)

Appl. No. 10/774128

54. (Previously presented) A welding, cutting or heating system capable of receiving a range of input voltages spanning at least two input utility voltages, comprising:

a power circuit comprising an input circuit, a converter and an output circuit, wherein the power circuit is capable of providing a welding cutting or heating output without reconfiguring the power circuit;

wherein the input circuit is configured to receive any input voltage within the range of input voltages, and configured to provide a first dc signal;

wherein the converter includes a boost circuit and is configured to receive and boost the first dc signal and to provide a converter output, and configured to receive at least one control input;

wherein the output circuit is configured to receive the converter output and to provide the welding, heating or cutting signal; and

a controller, including a power factor correction circuit, configured to provide at least one control signal to the converter.

55. (Previously presented) The system of claim 54, further comprising an auxiliary power circuit configured to receive the any voltage within the range of input voltages and configured to provide a control power signal to the controller.

56. (Previously presented) The system of claim 54, wherein the output circuit further comprises a pulsed transformer.

57. (Previously presented) The system of claim 56, wherein the output circuit includes a pulse width modulator connected to the transformer.

58. (Previously presented) A method of providing welding, cutting or heating current from a range of input voltages spanning at least two input utility voltages, comprising:

receiving an input voltage and converting it to a first dc bus having a voltage magnitude higher than the input voltage, without reconfiguring a power circuit;

controlling the converting, including power factor correcting by controlling a switch; and

receiving the first dc bus and providing in response thereto an output current having an output magnitude suitable for a welding, heating or cutting.

59. (Previously presented) The method of claim 58, wherein converting includes rectifying.

60. (Previously presented) The method of claim 59, further comprising deriving auxiliary power from the input voltage and providing the derived power as a power signal to a controller.

61. (Previously presented) The method system of claim 60, wherein providing in response thereto includes pulsing a transformer.

62. (Cancelled.)

63. (Previously presented) A welding, cutting or heating system capable of receiving a range of input

voltages spanning at least two input utility voltages, comprising:

input means for receiving any input voltage within the range of input voltages, and for providing a first dc signal;

converter means for receiving and boosting the first dc signal and providing a converter output in response to at least one control input without reconfiguring a power circuit;

output means for receiving the converter output and providing a welding, heating or cutting signal; and

control means for controlling, including power factor correcting, the converter means, connected to the converter means.

64. (Previously presented) The system of claim 63, further comprising auxiliary power means for providing a control power signal to the control means in response to receiving the any voltage within the range of input voltages.

65. (Previously presented) The system of claim 63, wherein the output means further comprises means for pulsing a transformer that receives the converter output.

66. (Cancelled.)

67. (Previously presented) A welding, cutting or heating system capable, comprising:

a power circuit comprising an input circuit, a converter and an output circuit, wherein the power circuit is capable of providing a welding cutting or heating output;

wherein the input circuit is configured to receive at least one input voltage, and provide a converter input signal to the converter;

wherein the converter includes a boost circuit and is configured to receive and boost the converter input signal and to provide a dc bus output, and configured to receive at least one control input;

wherein the output circuit is configured to receive the dc bus, and to provide the welding, heating or cutting signal;

a controller, including a power factor correction circuit, configured to provide at least one control signal to the converter; and

an auxiliary power circuit configured to receive any voltage within a range of input voltages spanning at least two utility voltages, and configured to provide a control power signal to the controller.

68. (Currently Amended) The system of claim 67 ~~54~~, wherein the output circuit further comprises a pulsed transformer.

69. (Currently Amended) A method of providing welding, cutting or heating current comprising:

receiving an input voltage and converting it to a first dc bus having a voltage magnitude higher than the input voltage;

controlling the converting, including power factor correcting by controlling a switch;

receiving the first dc bus and providing in response thereto an output current having an output magnitude suitable for ~~a~~ welding, heating or cutting; and

deriving auxiliary power from any voltage within a range of input voltages spanning at least two utility voltages, and providing the derived power as a power signal to a controller.

70. (Previously presented) The method of claim 69, wherein converting includes rectifying.

71. (Cancelled.)

72. (Previously presented) A welding, cutting or heating system, comprising:

input means for receiving any input voltage within a range of input voltages spanning at least two utility voltages, and for providing a first dc signal;

converter means for receiving and boosting the first dc signal and providing a converter output in response to at least one control input;

output means for receiving the converter output and providing a welding, heating or cutting signal;

control means for controlling, including power factor correcting, the converter means, connected to the converter means; and

auxiliary power means for providing a control power signal to the controller in response to receiving the any voltage

73. (Cancelled.)

74. (Previously presented) A welding, cutting or heating power source capable of receiving a range of input voltages, comprising:

an input rectifier configured to receive an ac input, wherein the range includes a highest magnitude and a lowest magnitude, and wherein the highest magnitude is at least twice the lowest magnitude, and wherein the rectifier is configured to provide a first dc signal;

a boost converter connected to receive the first dc signal and provide a second dc output across a dc bus comprising a positive bus and a negative bus, wherein the boost converter is configured to receive at least one control input, and wherein the boost converter includes a boost inductor having a first end in electrical communication with the rectifier, and the boost inductor has a second end in electrical communication with a switch, wherein when the switch is closed the second end is in electrical communication with negative bus, and wherein the second end is in electrical communication with a diode, and the diode is further in electrical communication with the positive bus, such that current can flow from the second end through the diode to the positive bus;

a pulse width modulator connected to receive the dc bus and provide a pulsed signal;

an output transformer, having a primary connected to receive the pulsed signal and to provide an output signal having a current suitable for welding or cutting on a secondary;

a controller, including a power factor correction circuit, configured to provide at least one control signal to the converter; and

an auxiliary power source capable of providing a control power signal at a preselected control signal voltage, for a plurality of input voltages.

Appl. No. 10/774128

75. (Previously Amended) A method of providing welding, cutting or heating power from a range of input voltages, comprising:

rectifying an ac input, wherein the range includes a highest magnitude and a lowest magnitude, and wherein the highest magnitude is at least twice the lowest magnitude, and wherein the rectifier is configured to provide a first dc signal;

boost converting the first dc signal to a second dc output across a dc bus comprising a negative and positive bus, including receiving at least one control input, and boosting through a boost inductor having a first end in electrical communication with a rectifier, and a second end in electrical communication with a switch, wherein when the switch is closed the second end is in electrical communication with negative bus, and wherein the second end is in electrical communication with a diode, and the diode is further in electrical communication with the positive bus, such that current can flow from the second end through the diode to the positive bus;

pulse width modulating the dc bus to provide a pulsed signal;

transforming the pulsed signal to provide an output signal having a current suitable for welding or cutting;

controlling the boost converting to power factor correct; and

providing auxiliary power at a control power signal at a preselected control signal voltage, for a plurality of input voltages.

76-94. (Cancelled.)

95. (Previously presented) A welding or cutting power source, comprising:

an input circuit configured to receive an input having a magnitude over a range of inputs, wherein the range includes a highest magnitude at least twice a lowest magnitude, and to provide a first dc signal;

a boost converter, including a boost inductor connected to receive the first dc signal, wherein the boost converter has a dc bus output;

an output circuit configured to receive the dc bus output and to provide a welding or cutting signal; and

a controller, including a power factor correction circuit, configured to provide at least one control signal to the boost converter.

96. (Previously presented) The apparatus of claim 95, further including an auxiliary power source capable of providing a control power signal at a preselected control signal voltage for a plurality of magnitudes of the input signal.

97. (Previously presented) The apparatus of claim 96, wherein the auxiliary power source includes an auxiliary transformer with a plurality of primary taps.

98. (Previously presented) The apparatus of claim 95, wherein the output circuit includes a switched circuit connected across the dc bus, and a transformer having a primary connected in the switched circuit.

99. (Previously presented) The apparatus of claim 98, wherein the switched circuit is a pulse width modulator.

100. (Previously presented) The apparatus of claim 98, wherein the output circuit includes an output rectifier connected to a secondary of the transformer.

101. (Previously presented) The apparatus of claim 100, wherein the switched circuit includes an inverter.

102. (Previously presented) The apparatus of claim 100 wherein the output circuit includes an inductor connected to the output rectifier.

103. (Previously presented) The apparatus of claim 95 wherein the output circuit includes a cycloconverter.

104. (Previously presented) The apparatus of claim 103, further comprising a first output stud connected to the inductor, and disposed to be connected to one of a torch and a ground clamp, and a second output stud, disposed to be connected to the other of the torch and a ground clamp.